

REMARKS

Review and reconsideration of the Office Action of September 17, 2004 are respectfully requested in view of the above amendments and the following remarks.

Applicants appreciate the indication that claims 2, 3 and 12 are allowable, and that claim 9 (and thus dependent claims 10 and 11) are merely rejected for formalities.

Applicants present claims 2, 3, 9 and 12 as independent claims. Indication of allowance of claims 2, 3 and 9-12 is requested.

Present Invention

Parent U.S. Application No. 09/744,634 filed January 26, 2001, issued as U.S. Patent 6,698,890 on March 2, 2004, and concerned device for projecting a color-enhanced color image (the image including colors outside a normal BGR color three-point triangle).

The present application is a divisional of the above, and is directed to a device for ***stereo-projection*** using

- a first partial light bundle (B-1, G-1, R-1) and
 - a second partial light bundle (B-2, G-2, R-2)
- complementary*** to the first partial light bundle.

Office Action

Turning now to the Office Action in greater detail, the paragraphing of the Examiner is adopted.

Claim Rejections - 35 USC § 112

Claims 9-11 are rejected under 35 U.S.C. §112, second paragraph. The Examiner points out that there is a lack of antecedent basis for the "first" and "second" dichroic mirrors recited in claims 9 and 10 (and 11).

In response, Applicants change the terminology to "splitter" and "integrator" dichroic mirrors for consistency and proper antecedent basis, thereby overcoming the rejection and making the claims allowable.

Withdrawal of the rejection is respectfully requested.

Claim Rejections - 35 U.S.C. §102

Claims 1, 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (U.S. Patent No. 5,121,983).

The position of the Examiner can be found on page 2 and 3 of the Office Action.

Applicants respectfully traverse.

Lee describes a stereo-projection system in which the two partial images - one for the left eye and one for the right eye - are produced using **polarized** light beams of differing, namely **orthogonal**, orientation. The use of filter glasses with different (orthogonal) left and right polarization allows the separation of the two partial images into left and right, i.e., blockage of the undesired partial image to one eye (left or right) and transmission to the other eye (right or left). This enables achievement of a stereo-effect. As disclosed in Lee: "Thereafter, the left and right video signals are projected on a

screen M by the two polarizing beams whose polarizing directions are perpendicular to each other so that the viewers can feel the stereoscopic image by using a polarizing optical." (col. 4, lines 48-52).

The physics underlying the projector of Lee are fundamentally different from the physics underlying the present invention, and these differences have significant practical consequences.

First, the system of Lee requires the use of a **projection surface that does not change the orientation** of the light upon reflection. Any rotation of the polarization of the reflected light destroys the stereo effect and/or substantially reduces the brilliance of the reproduced images.

The present invention, in contrast, is not limited to any particular projection screen, since there is no requirement to maintain polarized orientation.

Second, for the polarized filters of Lee to work effectively, they **must be in their proper orientation relative to the screen**, that is, relative to the orientation of the polarity of the reflections. The system of Lee operates on the presumption that the observer will maintain his head in a vertical orientation. Any tilting of the head will reduce the blockage of the undesired polarized partial image and begin to cause blockage of the desired polarized image, thus reducing the desired signal and introducing into the left eye signals intended for the right eye, and vice versa, destroying the illusion of stereo vision.

In the present invention, in contrast, tilting of the head does not change the image received by the left or right eye.

Third, the system of the present invention is based not on blocking, as with Lee, but rather on presentation of a supplemental or broader spectrum of colors, using complementary colors for left and right eyes. The result is that the present projection system produces not a weaker but rather a **more intense** color image.

Typically color image recording and reproduction is based on three "primary" colors (B, G, R) which can be additively mixed to form other colors. When plotted on an X,Y chromaticity diagram, are represented by the area covered by a BGR triangle. The area outside the triangle is an area of natural color not reproducible by the single BGR projector, and is thus an omitted area of natural colors. True colors lying outside the triangle are not reproducible.

The present invention produces a stereo image by of reproducing colors lying (a) inside the X,Y chromaticity diagram as well as (b) **outside the X,Y chromaticity diagram**.

The present invention accomplishes this by dividing light of an image into a first partial light bundle (B1, G1, R1) for the partial image for the left eye and a second light bundle (B2, G2, R2) **complementary** to the first light bundle for the partial image for the right eye. The device for recording and the device for projecting both use the same or complementary optical components (e.g., beam splitter and beam integrator) and employ the same principle of beam splitting in order to **enhance color reproducibility**.

Thus, in addition to projecting a stereo image, the present system provides an enhanced color image.

Accordingly, Lee can provide no suggestion for the present invention. Lee only uses three colors (B, R, G) which can be plotted on a single chromaticity diagram, thus has no relation to the problem/solution of recording and reproducing in stereo colors outside the X,Y chromaticity diagram triangle using three colors and three complementary colors. In Lee the first and second partial light bundles are not for **complementary** colors. Rather, they are for the **same** colors (same frequency range); they differ only in that they are **polarized images** with lightwaves of one image being perpendicular to the lightwaves of the other image.

Again, regarding differences in practical effect attributable to the underlying principles of the invention:

- (a) the present invention uses the two sets of complementary colors to make a rich stereoscopic image; is not possible using the polarized images of Lee to produce colors outside the RGB triangle according to the present invention,
- (b) using polarized light, Lee can even project a black-and-white image in stereo; the present invention operates in color,
- (c) if the reflective projection surface does not maintain the orientation of polarized light, the projection system of Lee becomes inoperable, the system of the present invention however is undisturbed, and

(d) if the viewer tilts his head, the system of Lee produces double vision and left-right interference, the system of the present invention is not susceptible to these problems.

Accordingly, withdrawal of the rejection is respectfully requested.

Claim Rejections - 35 U.S.C. 103

Claim 8 (stereo glasses, with one lens in transmission range (B1, G1, R1) and the other lens in transmission range (B2, G2, R2) is rejected under 35 U.S.C. 103(a) as being obvious over Lee (U.S. Patent No. 5,121,983) in view of Faris (U.S. Patent No. 5,886,816).

Applicants respectfully traverse.

As discussed above, the present invention is based on projection using complementary color bundles.

Both references cited by the Examiner concern polarized light to achieve stereoscopic vision. Neither Lee nor Faris provide any suggestion for use of complementary color bundles, or the advantages associated therewith as explained in detail above.

Accordingly, withdrawal of the rejection is respectfully requested.

Allowable Subject Matter

Claims 2-3 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in

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AMENDMENT A

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independent form including all of the limitations of the base claim and any intervening claims.

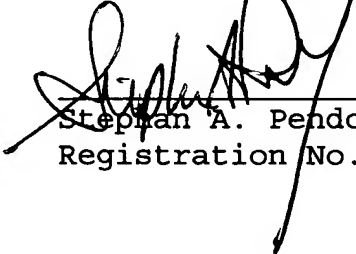
Applicants appreciate this indication, and note that by amending claims 9-11 to overcome the §112 rejection, these claims should also be allowable.

Claims 2, 3, 9 and 12 are presented as independent claims.

Accordingly, early issuance of the Notice of Allowance is respectfully requested. Should the Examiner have any further suggestions regarding claims 12-30, he is respectfully requested to contact the undersigned at the indicated telephone number.

Respectfully submitted,

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AMENDMENT A

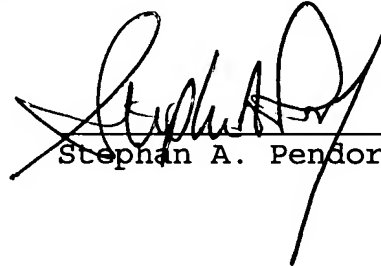
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CERTIFICATE OF MAILING AND AUTHORIZATION TO CHARGE

I hereby certify that the foregoing AMENDMENT A for U.S. Application No. 10/790,389 filed March 1, 2004, was deposited in first class U.S. mail, with sufficient postage, addressed: Mail Stop Amendment, Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria, VA 22313-1450, on **December 16, 2004**.

The Commissioner is hereby authorized to charge any additional fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account No. 16-0877.


Stephan A. Pendorf